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COMPOSITAE OF CENTRAL AMERICA–II. *ORTIZACALIA* (SENECIONEAE: SENECIONINAE), A NEW GENUS OF LIANAS WITH COMOSE STYLE BRANCHES

JOHN F. PRUSKI
Missouri Botanical Garden
P.O. Box 299
St. Louis, Missouri 63166

ABSTRACT

Ortizacalia Pruski (Compositae: Senecioneae) is described as a new monotypic genus from Costa Rica and the combination **Ortizacalia austin-smithii** (Standl.) Pruski is made. *Ortizacalia* is diagnosed by its densely long-comose style branch apices with 15–20 penicellate papillae in a tuft twice the length of the branch diameter. *Ortizacalia* is placed in subtribe Senecioninae and compared to other regional genera of lianas of the subtribe.

KEY WORDS: Asteraceae, Compositae, Central America, Costa Rica, *Dresslerothamnus,* lianas, *Ortizacalia*, *Pentacalia*, Senecioneae, Senecioninae.

The new genus *Ortizacalia* Pruski (Compositae: Senecioneae: Senecioninae) from Costa Rica is described and compared to *Dresslerothamnus* H. Rob. and *Pentacalia* Cass., its close congeners. *Ortizacalia* keys to or near *Pentacalia* or species now referred to *Pentacalia* in the keys in Barkley (1975, 1985), Barkley et al. (1996), Cuatrecasas (1986), Díaz-Piedrahita and Cuatrecasas (1999), Janovec and Robinson (1997), Nordenstam (2007), Standley (1938), and Williams (1984). However, upon seeing an image of the comose style branches of *Ortizacalia*, Harold Robinson (pers. comm. IV-2012) commented that "nothing that looks like that has been called *Pentacalia* by either Nordenstam or myself." *Ortizacalia* is superficially similar to several of the vining West Indian senecioid genera treated by Nordenstam (1978, 2006, 2007), but in technical features matches none of them. *Dresslerothamnus, Ortizacalia,* and *Pentacalia* are each lianas with caudate anthers (Fig. 1) and senecioid microfeatures (Figs. 1–2) typical of subtribe Senecioninae (Nordenstam 1978; Wetter 1983; Pelser et al. 2007; Pruski 2012), but *Ortizacalia* differs from the two others by densely long-comose style branch apices with penicellate papillae twice the length of the branch diameter (Fig. 2). Style branch characters have been used traditionally to distinguish genera of Senecioneae, and generally seem to be a reliable taxonomic character. For more than half a century *Ortizacalia*, by virtue of its cryptic early budding type collection, has flown under the taxonomic radar, but the recent rediscovery of this rare liana has allowed its distinctive characters to step to the fore.

ANATOMICAL AND SEM METHODS

The wet slide mounts were viewed on an Olympus compound microscope and photographed with a Canon A640 camera. SEM mounts were sputter-coated with Au/Pd on a Denton Desk V Cold Sputter Coater operating at 35 mAmps for 120 seconds and micrographed on a JEOL NeoScope JCM-5000 scanning electron microscope operating under high vacuum from 5–10 kV.

ORTIZACALIA Pruski, gen. nov. Figs. 1–5. **TYPE:** *Senecio austin-smithii* Standl. [≡ *Ortizacalia austin-smithii* (Standl.) Pruski].

Suffrutex volubilis; caules glabri vel distale puberuli; folia simplicia alterna petiolata, petiolo 0.8–2.5 cm longo, lamina 4–9 × 1–2.5 cm oblanceolata vel oblonga subcarnosa pinnatim venosa basi cuneata vel attenuata

margine integra; capitulescentia 8–25 × 6–18 cm terminalis corymboso–paniculata; pedunculi 4–15 mm longi; capitula radiata 10–12 mm alta; involucrum 3.5–5(–6) mm diam. cylindricum; phyllaria 8, 6–7.5 × 0.8–1.3 mm lanceolata glabra vel distale puberuli; flosculi radiati (0–)2–5, corolla luteola vel aurantiaca glabra, tubo 4–5.5 mm longo, limbo 5–8 × 0.8–1.2 mm longo 4-nervio; flosculi disci 10–16, corolla 8–9.5 mm longa infundibuliforma luteola glabra, tubo et limbo subaequalia, lobis circiter 1.5 mm longis lanceolatis; antherae circiter 2.5 mm longae caudatae, collum basi dilatatum; styli rami 1.3–1.7 mm longi valde et longe comosi, areis stigmaticis discretis; cypselae 1.3–2 mm longae circiter 5-costatae glabrae; setae pappo 7.5–8.5 mm longo.

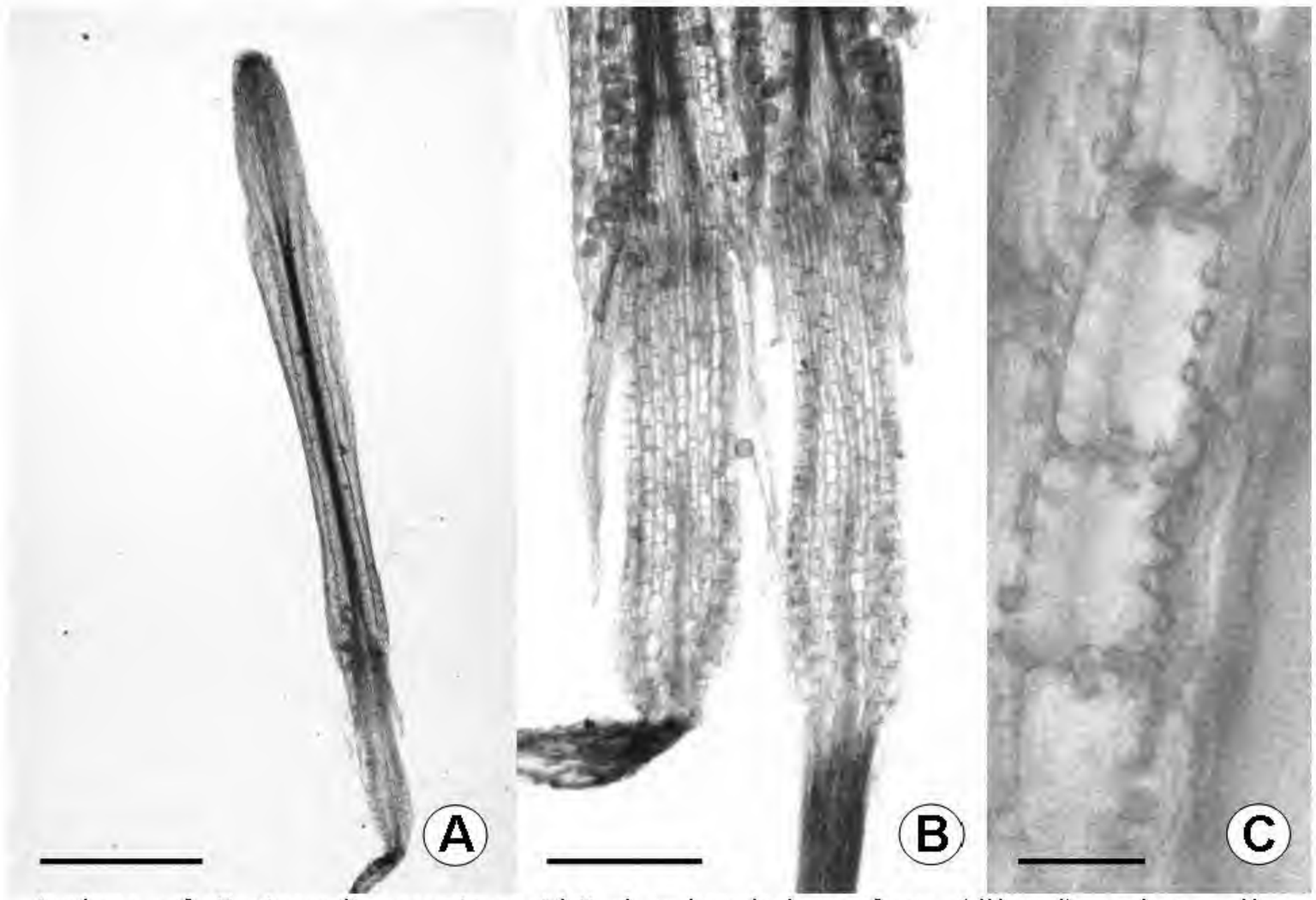

Figure 1. Anthers of *Ortizacalia austin-smithii* showing balusterform (dilated) anther collars that are a diagnostic subtribal feature of subtribe Senecioninae. A. Individual anther abaxial face showing ovate anther appendage, caudate theca, and balusterform anther collar. B. Abaxial close-up showing caudate anther thecae and balusterform anther collars. C. Medial adaxial endothecial tissue with transitional cell wall thickenings. (*Haber & Zuchowski 9847*, MO). [Scale bars: A, 0.5 mm; B, 0.1 mm; C, 20 μm.]

Scandent to climbing subglabrous woody vines, flowering branches pendent; stems subterete, few-branched distally, griseous-ochraceous, glabrous proximally, puberulent distally, leafy distally, distal internodes shorter than leaves, bark smooth, pith solid; herbage when pubescent with simple trichomes. **Leaves** simple, alternate, petiolate; petiole slender, exalate; blade oblanceolate to oblong, subcarnose, venation pinnate, secondary veins neither impressed nor prominent, margins entire, surfaces glabrous, eglandular. **Capitulescence** (Fig. 4) corymbiform-paniculate, pluricapitulate, terminal on main axis or on elongated lateral branches much longer than subtending leaves, branch axis neither foreshortened below nor within capitulescence, proximal and mid-capitulescence branches typically subtended by subsessile leafy bracts, distal branchlets few-bracteolate, thinly crisped-puberulent, ultimate clusters of capitula rounded; peduncles erect, thinly crisped-puberulent, 1–few-bracteolate. **Capitula** (Fig. 5) short-radiate, usually 12–21-flowered; involucre cylindrical, irregularly and loosely calyculate; phyllaries 8, 1-seriate, free, indistinctly imbricate, venation of green midzone indistinct, mostly glabrous but apex usually puberulent; phoranthium (receptacle) flat, epaleate, crestate, solid (Fig. 3A). **Ray florets** pistillate; corolla yellow to orange, glabrous, limb slightly exserted, lanceolate to elliptic-lanceolate, 4-nerved, apex 3-denticulate; style rarely trifid, but when trifid each of the three branches equally comose. **Disk florets** bisexual, longer than to much longer than involucre; corolla funnelform, yellow, glabrous, 5-lobed, tube and limb subequal, lobes triangular-lanceolate, shorter than throat, spreading to recurved,

apex papillose; anthers (Fig. 1) yellow to orangish, collar balusterform (distal cells somewhat quadrangular and basal cells bulbous to nearly isodiametric), theca base caudate, tails shorter than collar, endothecial tissue transitional with both vertical and horizontal cell walls irregularly thickened, apical appendage ovate, rounded apically; style base abruptly dilated, branches (Fig. 2) spreading to recurved, distal half of abaxial surface rough and densely papillose with ovoid–obovoid apically obtuse–rounded papillae, subapically with dense semicircle of long papillae spreading at about 45°, branch apex rounded, densely long-comose with 15–20 penicellate whitish papillae in a tuft about twice as long as branch diam., penicellate papillae stiffly erect with acute apex, stigmatic surface 2-banded. **Cypselae** (Fig. 3B) tardily maturing, subcylindrical, subprismatic, ca. 5-ribbed, glabrous, carpopodium distinct, with a distal rim; pappus bristles of rays and disks similar, 1-seriate, white, barbellate, reaching to about the base of the disk corolla lobes.

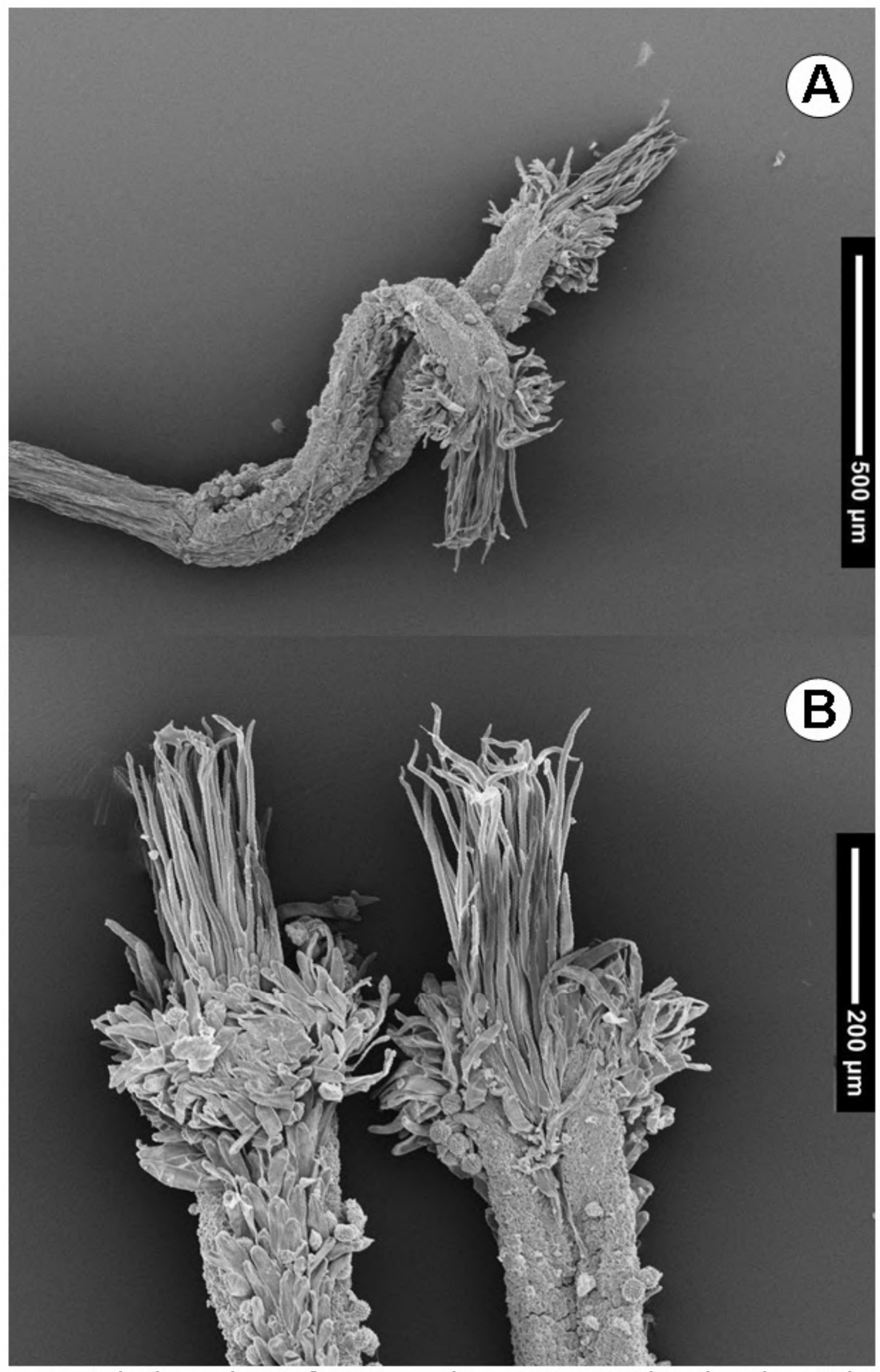

Figure 2. Apically comose style branches of *Ortizacalia austin-smithii* showing 2-banded stigmatic surfaces characteristic of subtribe Senecioninae. A. Branches showing the strongly papillose abaxial distal half of branch (left center) and apical comae. B. Close-up of abaxial surface (left) showing the densely penicellate-papillose apical coma, the subapical semicircle of long papillae, and at the bottom of the image the dense papillae of the distal half of branch; and adaxial branch surface (right) showing the penicellate-papillose apical coma, the lateral margins of the subapical-abaxial semicircle of long papillae, and at the bottom of the image the distal portion of the 2-banded stigmatic surfaces. (*Haber & Zuchowski 9847*, MO).

Etymology. I am very pleased to dedicate *Ortizacalia* to my fiancée, Dra. Rosa del Carmen Ortiz, in recognition of her keen eye and helping hand in the field, herbarium, and lab. Although while collecting Rosita is invariably in a menisperm liana mind-set, she has pointed out to me many composites, including *Pentacalia* vining in the forest of Peru, where she is most at home. *Ortizacalia* is so named also to draw attention to its relations to *Pentacalia*, and follows a string of generic names of Senecioneae using the suffix of *Cacalia*, which includes *Digitacalia* Pippen, *Koyamacalia* H. Rob. & Brettell, *Miricacalia* Kitam., *Monticalia* C. Jeffrey, *Sinacalia* H. Rob. & Brettell, and *Talamancalia* H. Rob. & Cuatrec.

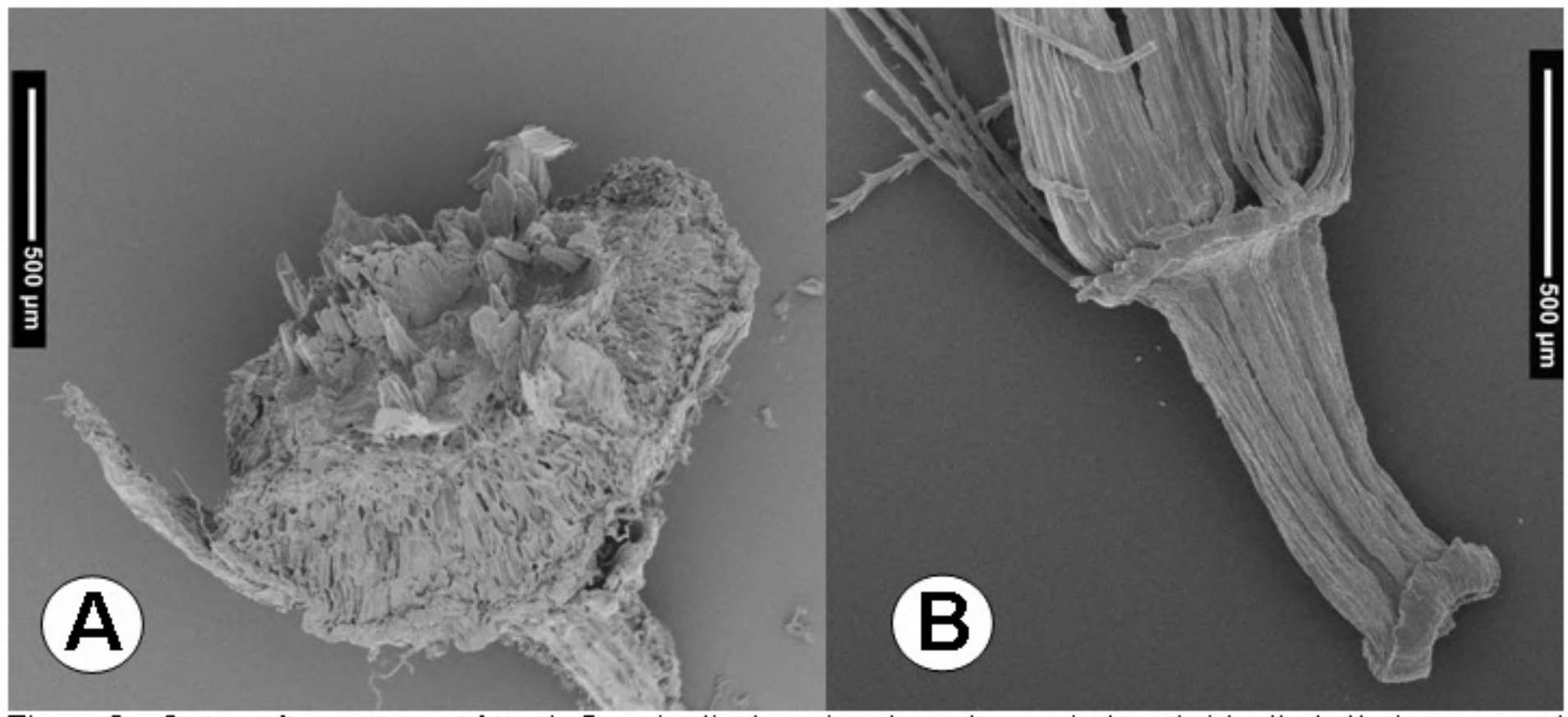

Figure 3. *Ortizacalia austin-smithii*. A. Longitudinal section through a capitulum (with all phyllaries removed except for the base of one phyllary on the left) showing the solid (non-fistulose) phoranthium (foreground) with crests on top. The peduncle is towards the lower right. B. Disk corolla base and cypsela showing the 1-seriate pappus and the distally rimmed carpopodium. (A, *Haber 11046*, MO; B, *Haber & Zuchowski 9847*, MO).

Ortizacalia, by its vining habit, simple leaves, caudate anthers (Fig. 1A–B), crestate solid phoranthia (Fig. 3A), and senecioid microfeatures (Figs. 1–2), is similar to *Dresslerothamnus* and especially to *Pentacalia*. *Dresslerothamnus* differs from *Ortizacalia* and *Pentacalia* by branched (vs. simple) trichomes, finely ca. 10- (vs. ca. 5-) ribbed tardily maturing cypselae, and when radiate by filiform (vs. usually lanceolate to elliptic) ray corolla limbs. *Ortizacalia* and *Pentacalia* have similar ca. 5-ribbed cypselae with well-defined carpopodia (Fig. 3B), but in their style branch ornamentation (Fig. 2) they differ by an order of magnitude. Robinson and Cuatrecasas (1978) describe the style branches of *Pentacalia* as "without distinct central coma of hairs" and commented that *P. matagalpensis* H. Rob. has unusually prominent distal style papillae. However, the stylar papillae of *P. matagalpensis* are about 0.1 mm long and very much shorter than the branch diameter. Pelser et al. (2007) found *Pentacalia* s. str. to be monophyletic and sister to shrubby *Scrobicaria* Cass. and the *Monticalia vaccinioides* (Kunth) C. Jeffrey group, but neither Central American species of *Pentacalia* nor *Dresslerothamnus* was not sampled by them.

Ortizacalia differs from *Dresslerothamnus*, *Pentacalia*, and other neotropical senecioids by its rounded style branches that (1) in their abaxial distal half are markedly roughened and densely papillose with ovoid–obovoid apically obtuse–rounded papillae and (2) are densely long-comose tufted apically with 15–20 stiffly erect narrowly penicellate acute-tipped papillae about twice as long as branch diameter (Fig. 2). The apical style branch papillae in *Ortizacalia* (along with those of the otherwise dissimilar southern South American *Graphistylis* B. Nord. and *Iocenes* B. Nord. s. str.) are proportionally among the longest in the Senecioneae. Other regional genera with apically pointed

Figure 4. *Ortizacalia austin-smithii* showing stems straight to slightly curved distally and some budding capitula that match those of the type collection. (Unmounted duplicate of *Estrada et al. 372*).

styles are either filiform-style branched (e.g., *Crassocephalum* Moench and *Gynura* Cass.); herbs or shrubs with a moderate apical style branch coma (e.g., *Arbelaezaster* Cuatrec., *Garcibarrigoa* Cuatrec., *Jacmaia* B. Nord., *Jessea* H. Rob. & Cuatrec., and *Talamancalia* H. Rob. & Cuatrec.); or have styles triangular-tipped and only moderately papillose (e.g., *Oldfeltia* B. Nord. & Lundin and *Pseudogynoxys* (Greenm.) Cabrera). None of these genera with pointed styles comprise woody vines with tailed anthers as do *Dresslerothamnus*, *Ortizacalia*, and *Pentacalia*. A few other regional Senecioneae have elongate-tipped styles (e.g., *Gynoxys* Cass.), but are members of subtribe Tussilagininae.

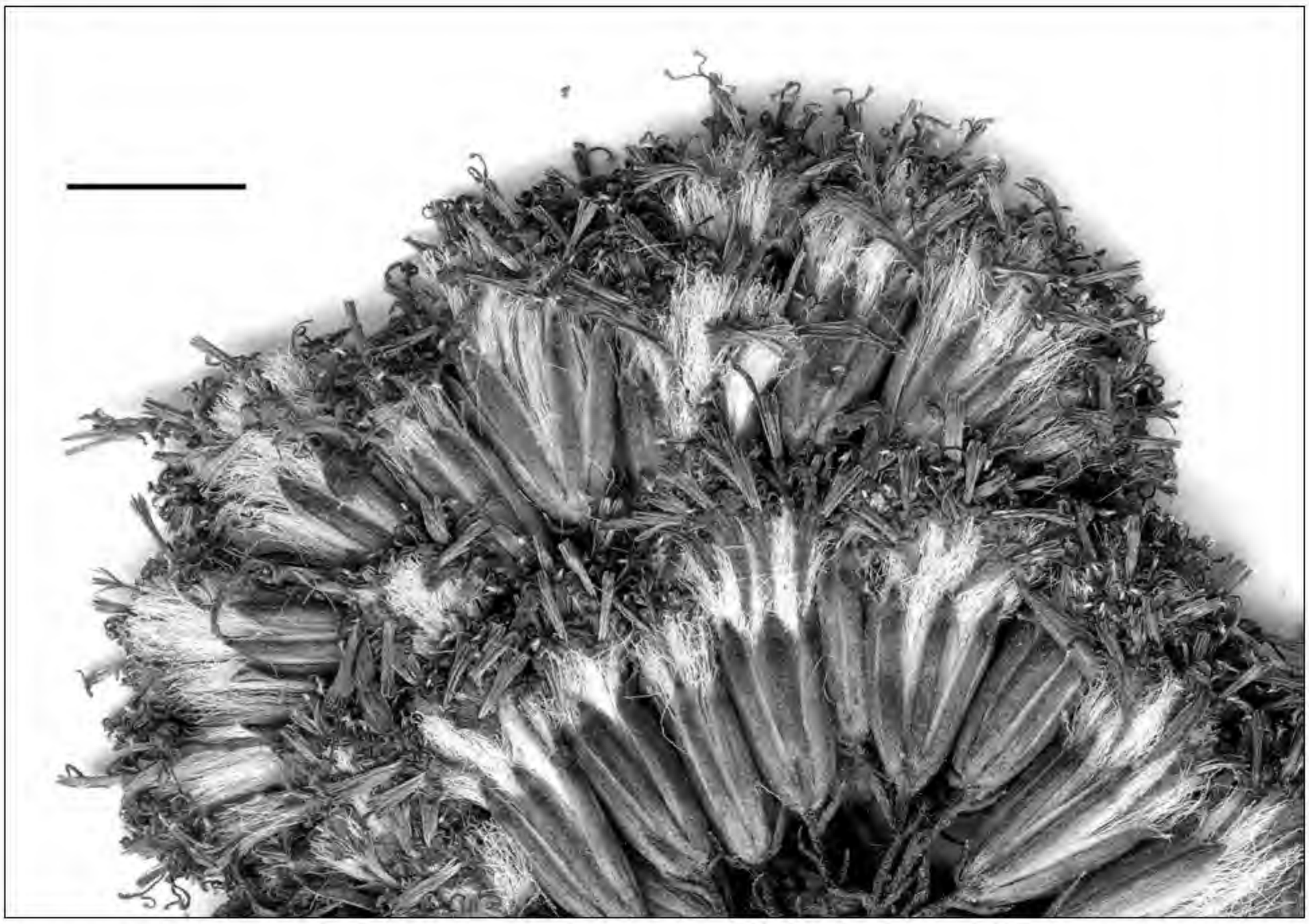

Figure 5. *Ortizacalia austin-smithii*. Close-up of capitula at anthesis. (*Haber 11046*, MO). [Scale bar: 5 mm.]

ORTIZACALIA AUSTIN-SMITHII (Standl.) Pruski, comb. nov. Figs. 1–5. *Senecio austin-smithii* Standl., Publ. Field Mus. Nat. Hist., Bot. Ser. 22: 128. 1940. **TYPE: COSTA RICA. Alajuela.** Palmira, 1890 m [as 6200 feet], 9 Feb 1938, *Austin Smith H299* (holotype: F, photo in MO; isotype: MO).

Liana climbing 1.6–5+ m into tree crowns, with 1–3 m long pendant flowering branches; stems straight to slightly curved distally (Fig. 4), leaf scars ca. 2 mm diam., raised. **Leaves**: petiole 0.8–2.5 cm long; blade 4–9 × 1–2.5 cm, secondary veins usually 3–4, thin, straight, at ca. 45° to midrib, third order veins indistinct, base cuneate to attenuate, margins sometime slightly revolute, apex usually obtuse to rounded, adaxially subnitidous. **Capitulescence** 8–25 × 6–18 cm, 30–100+-capitulate, proximal and mid-capitulescence leafy bracts 2–3 × 0.4–1 cm, narrowly oblanceolate, glabrous, distal branchlet bracteoles 0.5–1 cm long, lanceolate, sessile, subglabrous to thinly puberulent; peduncles 4–15 mm long, bracteoles 1–2 mm long, linear-lanceolate, sessile. **Capitula**

10–12 mm tall (Fig. 5); involucre 3.5–5(–6) mm diam.; phyllaries 6–7.5 × 0.8–1.3 mm, lanceolate, inner ones with narrowly scarious margins 0.2–0.4+ mm diam., narrower than green midzone; cristae on phoranthium (receptacle) 0.2–0.4 mm long. **Ray florets** (0–)2–5; corolla tube 4–5.5 mm long, limb 5–8 × 0.8–1.2 mm, subequal to or slightly longer than tube. **Disk florets** 10–16; corolla 8–9.5 mm long, tube 4–5 mm long, throat 2.5–3 mm long, lobes ca. 1.5 mm long; anthers (including appendage but not collar) ca. 2.5 mm long, collar 0.4–0.5 mm long, tails 0.2–0.3 mm long, apical appendage 0.4–0.5 mm long; style basal node 0.4–0.5 × ca. 0.3 mm, branches 1.3–1.7 mm long, apical coma papillae 15–20, 0.3–0.4 mm long. **Cypselae** (immature) 1.3–2 mm long, glabrous, carpopodium ca. 0.2 mm; pappus bristles 7.5–8.5 mm long.

Specimens examined: COSTA RICA. Alajuela. Palmira, 1890 m, 9 Feb 1938, *Austin Smith H299* (holotype, F; isotype: MO). **Heredia**. Cordillera Central, San José de la Montaña, Paso Llano, 10° 04′ 48″ N, 84° 06′ 36″ W, 1900 m, 11 Feb 1995, *Estrada et al. 372* (INB, MO + 1 unmounted duplicate, Fig. 4). **Puntarenas.** Monteverde, Pacific slope, moist forest patches and farms, 10° 18′ N, 84° 48′ W, 1300–1400 m, 5 Apr 1990, *Haber & Zuchowski 9847* (MO); Cordillera de Tilarán, Monteverde, Pacific slope, farms and forest patches around community, 10° 18′ N, 84° 48′ W, 1400 m, 7 Mar 1992, *Haber 11046* (CR, MO).

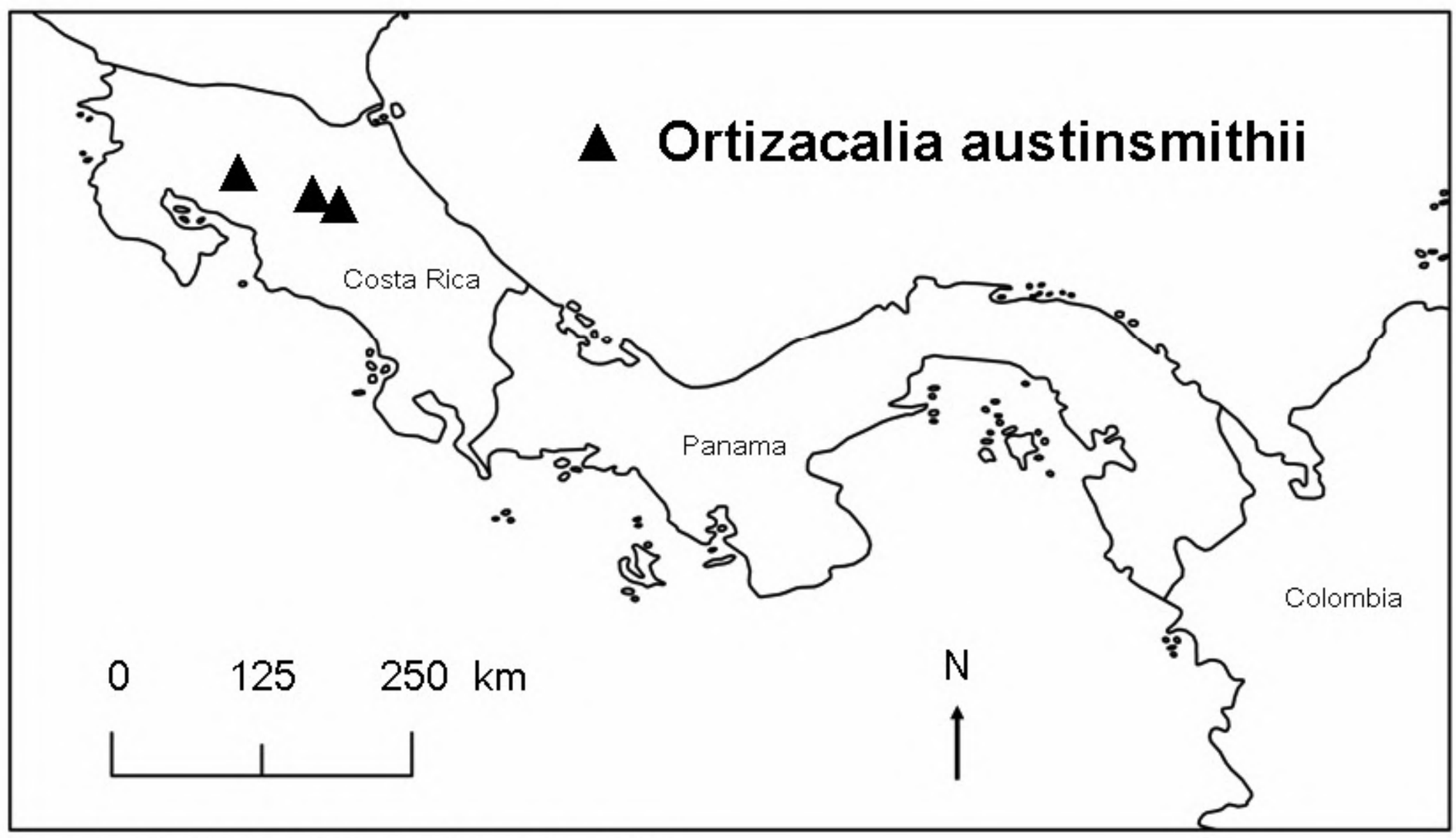

Figure 6. Distribution of *Ortizacalia austin-smithii*.

Distribution and ecology. *Ortizacalia austin-smithii* is a rare Costa Rican forest liana occurring mainly in the northwestern Pacific slope portion of the Cordillera de Tilarán near Monteverde (Prov. Puntarenas), eastwards into the Cordillera Central in Prov. Alajuela near Palmira about 15 km west of Volcán Poás, and in Prov. Heredia where its southeastern-most known station is about 8 kilometers south of Volcán Barva (Fig. 6). *Ortizacalia austin-smithii* occurs from 1300–1900 meters elevation at four localities within about 80 km of each other, and the four collections known to me show that this taxon is in bud and early flower in February and reaches anthesis in March and April.

The type collection is mostly in bud with few florets approaching anthesis, and for a long time I simply presumed this liana was a *Pentacalia*. The more recent collections afford sufficient material for comparative dissections, which show that the budding type, through the linking, early flowering *Estrada et al. 372* (Fig. 4), can be matched satisfactorily to the two mature collections cited here that voucher the plates of microcharacters of flowering capitula.

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